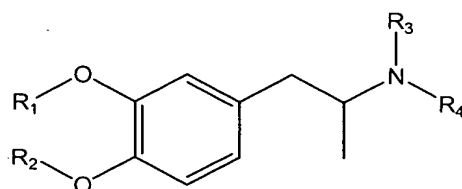


WHAT IS CLAIMED IS:

1. A compound of the formula:



Formula I

wherein: R¹ is H, lower alkyl, a protecting group, or is taken together with R² to form a ring,

R² is H, lower alkyl, a protecting group, $-(CH_2)_nSCH_2C(O)R^6$ or $-(CH_2)_nC(SO_2R^6)=CH_2$, or is taken together with R¹ to form a ring,

R³ and R⁴ are independently H or lower alkyl or a protecting group, or, when R¹ is taken together with R² to form a ring, at least one of R³ or R⁴ is $-C(O)(CH_2)_nR^5$, $-C(O)(CH_2)_nNHC(O)R^5$, $-C(O)(CH_2)_nNHC(O)(CH_2)_nSR^5$, $-(CH_2)_nC(SO_2R^5)=CH_2$, $-(CH_2)_nSCH_2C(O)R^5$, or $-(CH_2)_nC(SO_2R^5)=CH_2$, or when R¹ is not taken together with R² to form a ring, at least one of R¹ and R² is not H or lower alkyl or a protecting group,

R⁵ is H, -OH, -SH, -O-lower alkyl, halogen, NH₂, -succinimidyl, -maleimidyl, immunogenic carrier, or label,

R⁶ is H, -OH, -SH, -O-lower alkyl, halogen, NH₂, -succinimidyl, -maleimidyl, immunogenic carrier, or label, and

n is an integer from 1 to 5,

and including acid salts thereof.

2. A compound according to Claim 1 wherein said immunogenic carrier is a poly(amino acid).

3. A compound according to Claim 2 wherein said poly(amino acid) is a protein.

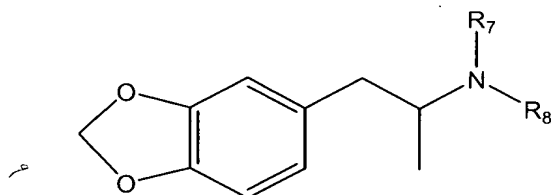
4. Antibodies raised against the compound of Claim 3.

5. A compound according to Claim 1 wherein n is 1.

6. A compound according to Claim 1 wherein said label is an enzyme, a luminescer, or a radioisotope.

5

7. A compound of the formula:



Formula II

10 wherein: R^7 is H, lower alkyl, a protecting group, $-C(O)(CH_2)_nR^5$, $-C(O)(CH_2)_nNHC(O)R^5$, $-C(O)(CH_2)_nNHC(O)(CH_2)_nSR^5$, $-(CH_2)_nC(SO_2R^5)=CH_2$, $-(CH_2)_nSCH_2C(O)R^5$, or $-(CH_2)_nC(SO_2R^5)=CH_2$,

R^8 is H, lower alkyl, a protecting group, $-C(O)(CH_2)_nR^5$, $-C(O)(CH_2)_nNHC(O)R^5$, $-C(O)(CH_2)_nNHC(O)(CH_2)_nSR^5$, $-(CH_2)_nC(SO_2R^5)=CH_2$, $-(CH_2)_nSCH_2C(O)R^5$, or $-(CH_2)_nC(SO_2R^5)=CH_2$,

15 R^5 is H, -OH, -SH, -O-lower alkyl, halogen, NH_2 , immunogenic carrier, -succinimidyl, -maleimidyl, or label, and

n is an integer from 1 to 5,

with the proviso that at least one of R^7 and R^8 are not H or lower alkyl, and

20 and including the acid salts thereof.

8. A compound according to Claim 7 wherein said protein is selected from the group consisting of KLH, BSA, BGG, and ovalbumin.

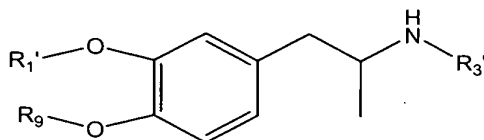
25 9. Antibodies raised against the compound of Claim 8.

10. A compound according to Claim 7 wherein n is 1.

11. A compound according to Claim 6 wherein R^7 is H or lower alkyl.

12. A compound according to Claim 7 wherein said label is an enzyme, a luminescer, or a radioisotope.

13. A compound of the formula:



wherein: $R^{3'}$ is H, methyl or ethyl or a protecting group,
 $R^{1'}$ is H or lower alkyl or a protecting group,
 R^9 is a protecting group, $-(CH_2)_nSCH_2C(O)R^6$ or $-(CH_2)_nC(SO_2R^6)=CH_2$,
 R^6 is H, -OH, -SH, -O-lower alkyl, halogen, NH_2 , immunogenic carrier,
 -succinimidyl, -maleimidyl, or label, and
 n is an integer from 1 to 5,
 and including acid salts thereof.

14. A compound according to Claim 13 wherein said protein is selected from the group consisting of KLH, BSA, BGG, and ovalbumin.

15. Antibodies raised against the compound of Claim 14.

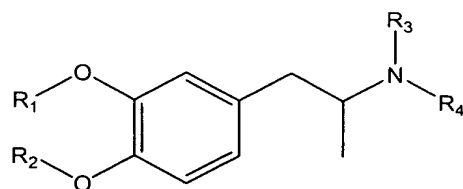
16. A compound according to Claim 13 wherein n is 1.

17. A compound according to Claim 13 wherein said label is an enzyme, a luminescer, or a radioisotope.

18. A method for determining a compound selected from the group consisting of 3,4-methylenedioxyamphetamine (MDA), 3,4-methylenedioxy-methamphetamine (MDMA), 3,4-methylenedioxyethylamphetamine (MDEA) and 4-hydroxy-3-methoxy-methamphetamine (HMMA), said method comprising:

(a) providing in combination in a medium:

- (i) a sample suspected of containing said compound and
- (ii) an antibody raised against a compound of the formula:



wherein: R^1 is H, lower alkyl, a protecting group, or is taken together with R^2 to form a ring,

5 R^2 is H, lower alkyl, a protecting group, $-(CH_2)_nSCH_2C(O)R^6$ or $-(CH_2)_nC(SO_2R^6)=CH_2$, or is taken together with R^1 to form a ring,

R^3 and R^4 are independently H or lower alkyl or a protecting group, or, when R^1 is taken together with R^2 to form a ring, at least one of R^3 or R^4 is $-C(O)(CH_2)_nR^5$, $-C(O)(CH_2)_nNHC(O)R^5$, $-C(O)(CH_2)_nNHC(O)(CH_2)_nSR^5$, $-(CH_2)_nC(SO_2R^5)=CH_2$, $-(CH_2)_nSCH_2C(O)R^5$, or $-(CH_2)_nC(SO_2R^5)=CH_2$, or when R^1 is not taken together with R^2 to form a ring, at least one of R^1 and R^2 is not H or lower alkyl or a protecting group,

R^5 is an immunogenic carrier,

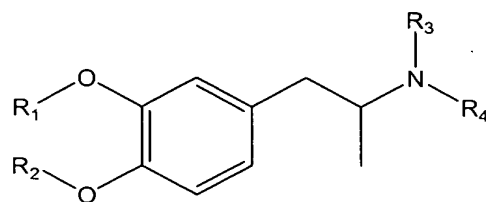
R^6 is an immunogenic carrier, and

15 n is an integer from 1 to 5, and

(b) examining said medium for the presence a complex comprising said compound and said antibody, the presence thereof indicating the presence of said compound in said sample.

20 19. A method according to Claim 18 wherein said combination further comprises:

(iii) a label conjugate of the formula:



25 wherein: R^1 is H, lower alkyl, a protecting group, or is taken together with R^2 to form a ring,

R^2 is H, lower alkyl, a protecting group, $-(CH_2)_nSCH_2C(O)R^6$ or

$-(CH_2)_n C(SO_2R^6)=CH_2$, or is taken together with R^1 to form a ring,

R^3 and R^4 are independently H or lower alkyl or a protecting group, or, when R^1 is taken together with R^2 to form a ring, at least one of R^3 or R^4 is

$-C(O)(CH_2)_nR^5$, $-C(O)(CH_2)_nNHC(O)R^5$, $-C(O)(CH_2)_nNHC(O)(CH_2)_nSR^5$,

5 $-(CH_2)_n C(SO_2R^5)=CH_2$, $-(CH_2)_nSCH_2C(O)R^5$, or $-(CH_2)_n C(SO_2R^5)=CH_2$, or when R^1 is not taken together with R^2 to form a ring, at least one of R^1 and R^2 is not H or lower alkyl or a protecting group,

R^5 is a label,

R^6 is a label, and

10 n is an integer from 1 to 5, and

said examining comprises measuring signal from said label, the amount thereof being related to the presence of said compound in said sample.

20. A method according to Claim 19 wherein said method is a homogeneous
15 method and said medium is examined for the amount of said signal.

21. A method according to Claim 18 wherein said method is a heterogeneous method and said complex, if present, is separated from said medium.

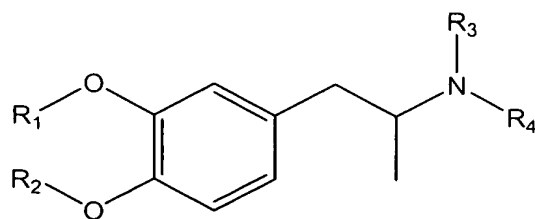
20 22. A method according to Claim 18 wherein said protein is selected from the group consisting of KLH, BSA, BGG and ovalbumin.

23. A method according to Claim 18 wherein n is 1.

25 24. A method according to Claim 19 wherein said label is an enzyme, a luminescer, or a radioisotope.

25. A kit for determining a compound selected from the group consisting of 3,4-methylenedioxyamphetamine (MDA), 3,4-methylenedioxy-methamphetamine (MDMA), 3,4-methylenedioxyethylamphetamine (MDEA) and 4-hydroxy-3-methoxy-methamphetamine (HMMA), said kit comprising:

(a) an antibody raised against a compound of the formula:



wherein: R^1 is H, lower alkyl, a protecting group, or is taken together with R^2 to form a ring,

5 R^2 is H, lower alkyl, a protecting group, $-(CH_2)_nSCH_2C(O)R^6$ or $-(CH_2)_nC(SO_2R^6)=CH_2$, or is taken together with R^1 to form a ring,

R^3 and R^4 are independently H or lower alkyl or a protecting group, or, when R^1 is taken together with R^2 to form a ring, at least one of R^3 or R^4 is $-C(O)(CH_2)_nR^5$, $-C(O)(CH_2)_nNHC(O)R^5$, $-C(O)(CH_2)_nNHC(O)(CH_2)_nSR^5$, $-(CH_2)_nC(SO_2R^5)=CH_2$, $-(CH_2)_nSCH_2C(O)R^5$, or $-(CH_2)_nC(SO_2R^5)=CH_2$, or when R^1 is not taken together with R^2 to form a ring, at least one of R^1 and R^2 is not H or lower alkyl or a protecting group,

R^5 is an immunogenic carrier,

R^6 is an immunogenic carrier, and

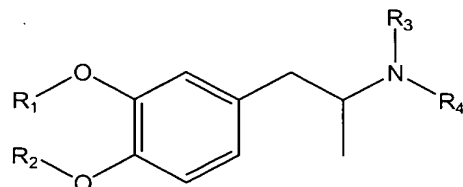
15 n is an integer from 1 to 5, and

(b) ancillary reagents for determining said compound.

26. A kit for determining a compound selected from the group consisting of 3,4-methylenedioxyamphetamine (MDA), 3,4-methylenedioxy-methamphetamine (MDMA), 3,4-methylenedioxyethylamphetamine (MDEA) and 4-hydroxy-3-methoxy-methamphetamine (HMMA), said kit comprising:

(a) an antibody for said compound,

(b) a label conjugate of the formula:



Formula V

wherein: R^1 is H, lower alkyl, a protecting group, or is taken together with R^2 to

form a ring,

R^2 is H, lower alkyl, a protecting group, $-(CH_2)_nSCH_2C(O)R^6$ or $-(CH_2)_nC(SO_2R^6)=CH_2$, or is taken together with R^1 to form a ring,

5 R^3 and R^4 are independently H or lower alkyl or a protecting group, or, when R^1 is taken together with R^2 to form a ring, at least one of R^3 or R^4 is $-C(O)(CH_2)_nR^5$, $-C(O)(CH_2)_nNHC(O)R^5$, $-C(O)(CH_2)_nNHC(O)(CH_2)_nSR^5$, $-(CH_2)_nC(SO_2R^5)=CH_2$, $-(CH_2)_nSCH_2C(O)R^5$, or $-(CH_2)_nC(SO_2R^5)=CH_2$, or when R^1 is not taken together with R^2 to form a ring, at least one of R^1 and R^2 is not H or lower alkyl or a protecting group,

10 R^5 is a label,

R^6 is a label, and

n is an integer from 1 to 5, and

(c) ancillary reagents for determining said compound.

15 27. A kit according to Claim 25 wherein said protein is selected from the group consisting of KLH, BSA, BGG and ovalbumin.

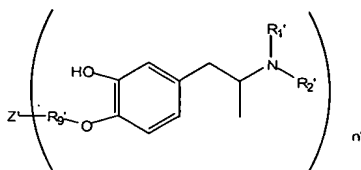
28. A kit according to Claim 25 wherein n is 1.

20 29. A kit according to Claim 26 wherein said label is an enzyme, a luminescer, or a radioisotope.

25 30. A method for determining amphetamine and/or methamphetamine and/or methylenedioxyamphetamine in a sample suspected of containing methylenedioxyamphetamine and/or methylenedioxymethamphetamine and/or methylenedioxyamphetamine, said method comprising:

(a) providing in combination in a medium:

- 30 (i) said sample,
- (ii) an antibody for methylenedioxyamphetamine, and/or
- (iii) an antibody for methylenedioxymethamphetamine, and/or
- (iv) an antibody for methylenedioxyamphetamine, and
- (v) a compound of the formula:



wherein:

$R^{1'}$ is H,

$R^{2'}$ is H, or methyl or ethyl,

5 $R^{9'}$ is $-(CH_2)_nSCH_2C(O)R^{6'}$ or $-(CH_2)_nC(SO_2R^{6'})=CH_2$,

$R^{6'}$ is Z' , which is an enzyme,

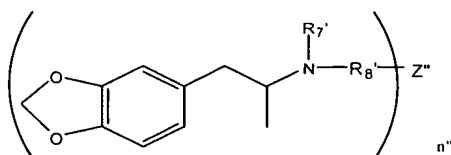
n' is an integer between 1 and the molecular weight of said enzyme divided by about 500; and

(b) examining said medium for the presence of a complex comprising said
 10 methylenedioxyamphetamine and said antibody for methylenedioxyamphetamine and/or
 a complex of said methylenedioxymethamphetamine and said antibody for
 methylenedioxymethamphetamine and/or a complex of said
 methylenedioxyethamphetamine and said antibody for methylenedioxyethamphetamine,
 the presence thereof indicating the presence of said methylenedioxyamphetamine and/or
 15 methylenedioxymethamphetamine and/or methylenedioxyethamphetamine in said
 sample.

31. A method for determining methylenedioxyamphetamine and/or
 methylenedioxymethamphetamine and/or methylenedioxyethamphetamine in a sample
 20 suspected of containing methylenedioxyamphetamine and/or
 methylenedioxymethamphetamine and/or methylenedioxyethamphetamine, said method
 comprising:

(a) providing in combination in a medium:

- (i) said sample,
 25 (ii) an antibody for methylenedioxyamphetamine, and/or
 (iii) an antibody for methylenedioxymethamphetamine, and/or
 (iv) an antibody for methylenedioxyethamphetamine, and
 (v) a compound of the formula:



wherein:

$R^{7'}$ is H, or methyl, or ethyl,

$R^{8'}$ is $-C(O)(CH_2)_nR^{5'}$, $-C(O)(CH_2)_nNHC(O)R^{5'}$, $-C(O)(CH_2)_nNHC(O)(CH_2)_nSR^{5'}$, $-(CH_2)_nC(SO_2R^{5'})=CH_2$, $-(CH_2)_nSCH_2C(O)R^{5'}$ or $-(CH_2)_nC(SO_2R^{5'})=CH_2$,

5 $R^{5'}$ is Z'' , which is an enzyme,

n'' is an integer between 1 and the molecular weight of said enzyme divided by about 500; and

(b) examining said medium for the presence of a complex comprising said methylenedioxyamphetamine and said antibody for methylenedioxyamphetamine and/or
10 a complex of said methylenedioxymethamphetamine and said antibody for methylenedioxymethamphetamine and/or a complex of said methylenedioxyethamphetamine and said antibody for methylenedioxyethamphetamine, the presence thereof indicating the presence of said methylenedioxyamphetamine and/or methylenedioxymethamphetamine and/or methylenedioxyethamphetamine in said
15 sample.

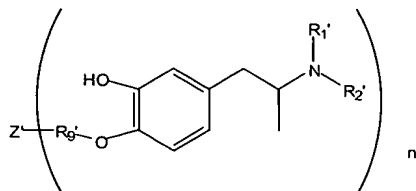
32. A method for determining methylenedioxyamphetamine and/or methylenedioxymethamphetamine and/or methylenedioxyethamphetamine in a sample suspected of containing methylenedioxyamphetamine and/or
20 methylenedioxymethamphetamine and/or methylenedioxyethamphetamine, said method comprising:

(a) providing in combination in a medium:

(i) said sample,

(ii) a conjugate of an enzyme and a methylenedioxyamphetamine
25 analog and/or a conjugate of an enzyme and a methylenedioxymethamphetamine analog and/or a conjugate of an enzyme and a methylenedioxyethamphetamine analog,

(iii) an antibody for methylenedioxyamphetamine, said antibody being raised against a compound of the formula:



30 wherein:

$R^{1'}$ is H,

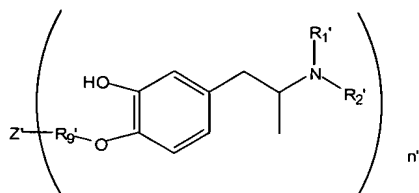
$R^{2'}$ is H,

$R^{9'}$ is $-(CH_2)_nSCH_2C(O)R^{6'}$ or $-(CH_2)_nC(SO_2R^{6'})=CH_2$,

$R^{6'}$ is Z' , which is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

n' is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500; and/or

(iv) an antibody for methylenedioxymethamphetamine, said antibody being raised against a compound of the formula:



wherein:

$R^{1'}$ is H,

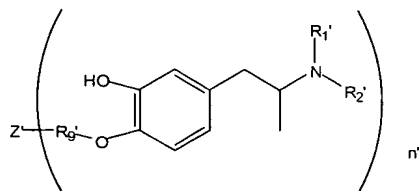
$R^{2'}$ is methyl,

$R^{9'}$ is $-(CH_2)_nSCH_2C(O)R^{6'}$ or $-(CH_2)_nC(SO_2R^{6'})=CH_2$,

$R^{6'}$ is Z' , which is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

n' is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500; and/or

(v) an antibody for methylenedioxyethamphetamine, said antibody being raised against a compound of the formula:



wherein:

$R^{1'}$ is H,

$R^{2'}$ is ethyl,

$R^{9'}$ is $-(CH_2)_nSCH_2C(O)R^{6'}$ or $-(CH_2)_nC(SO_2R^{6'})=CH_2$,

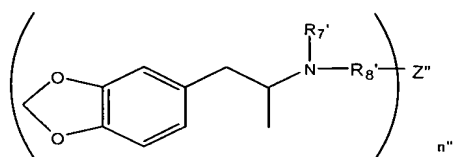
$R^{6'}$ is Z' , which is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

n' is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500; and

(b) examining said medium for the presence of a complex comprising said methylenedioxyamphetamine and said antibody for methylenedioxyamphetamine and/or
 5 a complex of said methylenedioxymethamphetamine and said antibody for methylenedioxymethamphetamine and/or a complex of said methylenedioxyethamphetamine and said antibody for methylenedioxyethamphetamine, the presence thereof indicating the presence of said methylenedioxyamphetamine and/or methylenedioxymethamphetamine and/or methylenedioxyethamphetamine in said
 10 sample.

33. A method for determining methylenedioxyamphetamine and/or methylenedioxymethamphetamine in a sample suspected of containing methylenedioxyamphetamine and/or methylenedioxymethamphetamine, said method
 15 comprising:

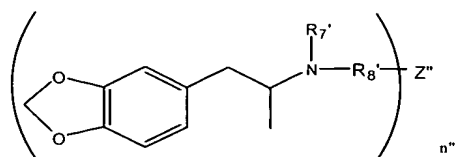
(a) providing in combination in a medium:
 (i) said sample,
 (ii) a conjugate of an enzyme and an methylenedioxyamphetamine analog and/or a conjugate of an enzyme and a methylenedioxymethamphetamine analog
 20 and/or a conjugate of an enzyme and a methylenedioxyethamphetamine analog,
 (iii) an antibody for methylenedioxyamphetamine, said antibody being raised against a compound of the formula:



wherein:

25 $R^{7'}$ is H,
 $R^{8'}$ is $-\text{C(O)(CH}_2\text{)}_n\text{R}^5$, $-\text{C(O)(CH}_2\text{)}_n\text{NHC(O)R}^5$, $-\text{C(O)(CH}_2\text{)}_n\text{NHC(O)(CH}_2\text{)}_n\text{SR}^5$,
 $-(\text{CH}_2)_n\text{C(SO}_2\text{R}^5)=\text{CH}_2$, $-(\text{CH}_2)_n\text{SCH}_2\text{C(O)R}^5$ or $-(\text{CH}_2)_n\text{C(SO}_2\text{R}^5)=\text{CH}_2$,
 $R^{5'}$ is Z'' , which is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,
 30 n'' is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500; and/or

(iv) an antibody for methylenedioxymethamphetamine, said antibody being raised against a compound of the formula:



wherein:

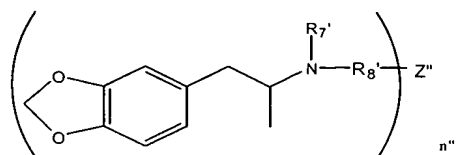
5 $R_{7'}$ is methyl,

$R_{8'}$ is $-\text{C}(\text{O})(\text{CH}_2)_n\text{R}^{5'}$, $-\text{C}(\text{O})(\text{CH}_2)_n\text{NHC}(\text{O})\text{R}^{5'}$, $-\text{C}(\text{O})(\text{CH}_2)_n\text{NHC}(\text{O})(\text{CH}_2)_n\text{SR}^{5'}$, $-(\text{CH}_2)_n\text{C}(\text{SO}_2\text{R}^{5'})=\text{CH}_2$, $-(\text{CH}_2)_n\text{SCH}_2\text{C}(\text{O})\text{R}^{5'}$ or $-(\text{CH}_2)_n\text{C}(\text{SO}_2\text{R}^{5'})=\text{CH}_2$,

$R^{5'}$ is Z'' , which is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

10 n'' is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500; and/or

(v) an antibody for methylenedioxyethamphetamine, said antibody being raised against a compound of the formula:



15 wherein:

$R_{7'}$ is ethyl,

$R_{8'}$ is $-\text{C}(\text{O})(\text{CH}_2)_n\text{R}^{5'}$, $-\text{C}(\text{O})(\text{CH}_2)_n\text{NHC}(\text{O})\text{R}^{5'}$, $-\text{C}(\text{O})(\text{CH}_2)_n\text{NHC}(\text{O})(\text{CH}_2)_n\text{SR}^{5'}$, $-(\text{CH}_2)_n\text{C}(\text{SO}_2\text{R}^{5'})=\text{CH}_2$, $-(\text{CH}_2)_n\text{SCH}_2\text{C}(\text{O})\text{R}^{5'}$ or $-(\text{CH}_2)_n\text{C}(\text{SO}_2\text{R}^{5'})=\text{CH}_2$,

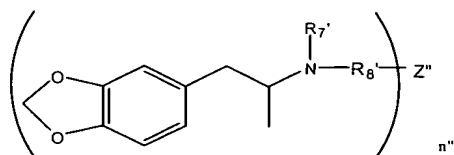
20 $R^{5'}$ is Z'' , which is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

n'' is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500; and

(b) examining said medium for the presence of a complex comprising said methylenedioxyamphetamine and said antibody for methylenedioxyamphetamine and/or
 25 a complex of said methylenedioxymethamphetamine and said antibody for methylenedioxymethamphetamine and/or a complex of said methylenedioxyethamphetamine and said antibody for methylenedioxyethamphetamine, the presence thereof indicating the presence of said amphetamine and/or methamphetamine and/or methylenedioxyethamphetamine in said sample.

34. A kit comprising in packaged combination:

- (i) an antibody for methylenedioxyamphetamine, and/or
- (ii) an antibody for methylenedioxymethamphetamine, and/or
- (iii) an antibody for methylenedioxyethamphetamine, and
- (iv) a compound of the formula:



wherein:

$\text{R}_{7'}$ is H, or methyl, or ethyl,

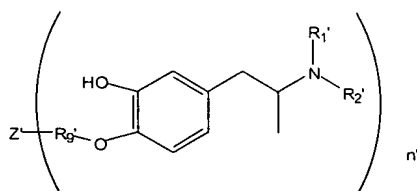
R_8 is $-\text{C}(\text{O})(\text{CH}_2)_n\text{R}^{5'}$, $-\text{C}(\text{O})(\text{CH}_2)_n\text{NHC}(\text{O})\text{R}^{5'}$, $-\text{C}(\text{O})(\text{CH}_2)_n\text{NHC}(\text{O})(\text{CH}_2)_n\text{SR}^5$, $-(\text{CH}_2)_n\text{C}(\text{SO}_2\text{R}^{5'})=\text{CH}_2$, $-(\text{CH}_2)_n\text{SCH}_2\text{C}(\text{O})\text{R}^{5'}$ or $-(\text{CH}_2)_n\text{C}(\text{SO}_2\text{R}^{5'})=\text{CH}_2$,

$\text{R}^{5'}$ is Z'' , which is an enzyme,

n'' is an integer between 1 and the molecular weight of said enzyme divided by about 500.

35. A kit comprising in packaged combination:

- (i) an antibody for methylenedioxyamphetamine,
- (ii) an antibody for methylenedioxymethamphetamine, and/or
- (iii) an antibody for methylenedioxyethamphetamine, and
- (iv) a compound of the formula:



wherein:

$\text{R}_{1'}$ is H,

$\text{R}_{2'}$ is H, or methyl or ethyl,

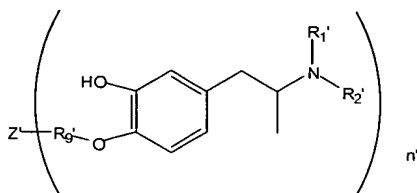
R_9 is $-(\text{CH}_2)_n\text{SCH}_2\text{C}(\text{O})\text{R}^{6'}$ or $-(\text{CH}_2)_n\text{C}(\text{SO}_2\text{R}^{6'})=\text{CH}_2$,

$\text{R}^{6'}$ is Z' , which is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

n' is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500.

36. A kit comprising in packaged combination:

- 5 (i) a conjugate of an enzyme and a methylenedioxyamphetamine analog and/or a conjugate of an enzyme and a methylenedioxymethamphetamine analog, and/or a conjugate of an enzyme and a methylenedioxyethamphetamine analog, and
- (ii) an antibody for methylenedioxyamphetamine, said antibody being raised against a compound of the formula:



10

wherein:

R^{1'} is H,

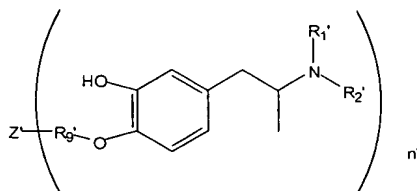
R^{2'} is H,

R^{9'} is $-(\text{CH}_2)_n\text{SCH}_2\text{C}(\text{O})\text{R}^{6'}$ or $-(\text{CH}_2)_n\text{C}(\text{SO}_2\text{R}^{6'})=\text{CH}_2$,

- 15 R^{6'} is Z', which is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

n' is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500; and/or

- 20 (iii) an antibody for methylenedioxymethamphetamine, said antibody being raised against a compound of the formula:



wherein:

R^{1'} is H,

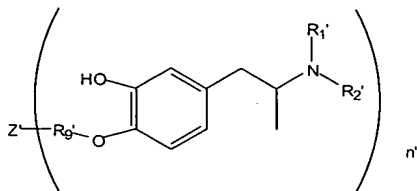
R^{2'} is methyl,

- 25 R^{9'} is $-(\text{CH}_2)_n\text{SCH}_2\text{C}(\text{O})\text{R}^{6'}$ or $-(\text{CH}_2)_n\text{C}(\text{SO}_2\text{R}^{6'})=\text{CH}_2$,

R^{6'} is Z', which is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

n' is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500, and/or

(iv) an antibody for methylenedioxyethamphetamine, said antibody being raised against a compound of the formula:



5

wherein:

$R^{1'}$ is H,

$R^{2'}$ is ethyl,

$R^{9'}$ is $-(CH_2)_nSCH_2C(O)R^{6'}$ or $-(CH_2)_nC(SO_2R^{6'})=CH_2$,

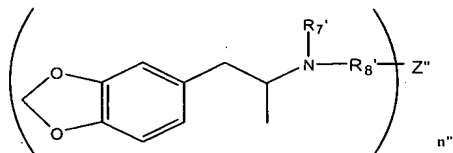
10 $R^{6'}$ is Z' , which is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

n' is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500.

15 37. A kit comprising in packaged combination:

(i) a conjugate of an enzyme and a methylenedioxyamphetamine analog and/or a conjugate of an enzyme and a methylenedioxymethamphetamine analog, and/or a conjugate of an enzyme and a methylenedioxyethamphetamine analog, and

20 (ii) an antibody for methylenedioxyamphetamine, said antibody being raised against a compound of the formula:



wherein:

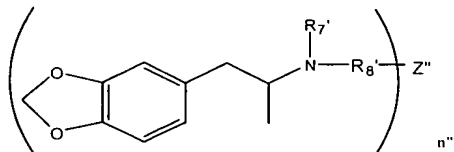
$R^{7'}$ is H,

25 $R^{8'}$ is $-C(O)(CH_2)_nR^{5'}$, $-C(O)(CH_2)_nNHC(O)R^{5'}$, $-C(O)(CH_2)_nNHC(O)(CH_2)_nSR^{5'}$, $-(CH_2)_nC(SO_2R^{5'})=CH_2$, $-(CH_2)_nSCH_2C(O)R^{5'}$ or $-(CH_2)_nC(SO_2R^{5'})=CH_2$,

$R^{5'}$ is Z'' , which is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

n'' is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500; and/or

(iii) an antibody for methylenedioxymethamphetamine, said antibody being raised against a compound of the formula:



wherein:

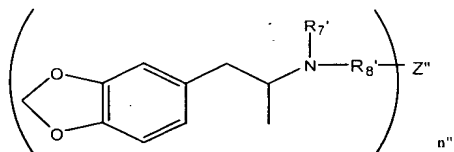
$R^{7'}$ is methyl,

$R^{8'}$ is $-\text{C(O)(CH}_2)_n\text{R}^{5'}$, $-\text{C(O)(CH}_2)_n\text{NHC(O)R}^{5'}$, $-\text{C(O)(CH}_2)_n\text{NHC(O)(CH}_2)_n\text{SR}^{5'}$, $-(\text{CH}_2)_n\text{C(SO}_2\text{R}^{5'})=\text{CH}_2$, $-(\text{CH}_2)_n\text{SCH}_2\text{C(O)R}^{5'}$ or $-(\text{CH}_2)_n\text{C(SO}_2\text{R}^{5'})=\text{CH}_2$,

$R^{5'}$ is Z'' , which is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

n'' is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500, and/or

(iv) an antibody for methylenedioxyethamphetamine, said antibody being raised against a compound of the formula:



wherein:

$R^{7'}$ is ethyl,

$R^{8'}$ is $-\text{C(O)(CH}_2)_n\text{R}^{5'}$, $-\text{C(O)(CH}_2)_n\text{NHC(O)R}^{5'}$, $-\text{C(O)(CH}_2)_n\text{NHC(O)(CH}_2)_n\text{SR}^{5'}$, $-(\text{CH}_2)_n\text{C(SO}_2\text{R}^{5'})=\text{CH}_2$, $-(\text{CH}_2)_n\text{SCH}_2\text{C(O)R}^{5'}$ or $-(\text{CH}_2)_n\text{C(SO}_2\text{R}^{5'})=\text{CH}_2$,

$R^{5'}$ is Z'' , which is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

n'' is an integer between 1 and the molecular weight of said immunogenic protein or said immunogenic carrier divided by about 500.

* * * * *